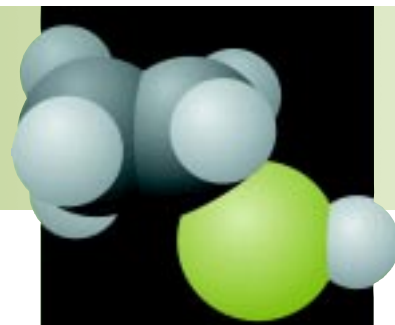# CHEMICALS

Project Fact Sheet

CORROSION MONITORING SYSTEM

BENEFITS

- *Estimated energy savings of 7.6 trillion Btu per year*
- *Increases productivity by providing predictive on-line tools that allow for optimal scheduling of process equipment shutdown for inspection and replacement*
- *Increases operational safety*

APPLICATIONS

Forest products, petroleum, food, agriculture, pharmaceutical and other processing industries will have improved productivity and safety from the use of an on-line corrosion monitoring system that provides detection, diagnostic and prognostic information.

ON-LINE CORROSION MONITORING SYSTEM WILL REDUCE ENERGY USE AND WASTE PRODUCTION

Current corrosion inspection and monitoring typically requires planned periodic shutdowns to inspect equipment. Scheduled shutdowns are costly in terms of productivity losses, restart energy and material costs. Unscheduled shutdowns are disruptive and often quite expensive. Internal corrosion failures result in costly cross contaminations of product and process streams. External corrosion leaks put process fluids into the plant environment and can create significant safety hazards.

Corrosion rates are difficult to predict since they depend on process variables (concentrations, temperature, flow rates, etc.) that may not be known or, until now, predictable. This project will develop an on-line Corrosion Monitoring System (CMS) that will aid in the prevention of unscheduled shutdowns and lengthen the time between scheduled shutdowns. The CMS software system will combine data from continuous corrosion sensors and process variable sensors to perform a non-intrusive, on-line inspection. This data will be interpreted using an "expert" diagnostic and predictive corrosion tool. The on-line CMS will automatically provide the process operator with information such as warning messages, the specific type of corrosion, predicted time frame for corrosion failure, and the specific reason for the corrosion problem.

CORROSION MONITORING SYSTEM

The initial application of CMS is targeted at optimizing productivity at chemical plants like the one shown above.

Project Description

Goal: Develop and demonstrate a continuous, on-line Corrosion Monitoring System (CMS) for the chemical processing industry. This will include selecting candidate sensors for testing, data collection, and development of algorithms. Testing and implementation of the final CMS system will be preformed in-plant at a chemical process facility at the conclusion of the project.
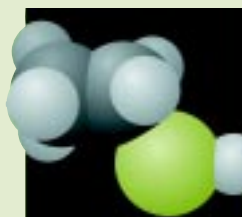
Progress and Milestones

This project includes the following activities:

- Define Corrosion Monitoring System performance goals
- Evaluate and select corrosion sensors
- Design and fabricate test equipment including heat exchangers, reactor pots, distillation columns and piping for accelerated corrosion testing and data collection
- Assemble and test CMS hardware platform. Select, write and test software
- Develop diagnostic corrosion algorithms for general corrosion, pitting corrosion and stress corrosion cracking
- Develop prognostic corrosion algorithms to predict the time frame and likelihood of occurrence for a corrosion failure
- Conduct system performance tests
- Test and modify algorithms to reach performance goals
- Install CMS in a chemical plant for pre-demonstration testing
- Write test plan and perform demonstration test in a chemical plant of the diagnostic and prognostic decision algorithms

Commercialization

Honeywell's Industrial Automation and Controls division currently markets a wide range of instrumentation and control products with advanced software to the a wide range of process industries. Once CMS testing is completed, Honeywell will rapidly introduce this technology to markets that are looking for methods to reduce down-time, increase productivity and save energy.